

Xinger

**Low Profile Balun
50Ω to 25Ω Balanced**

Description:

The XMB0810G3-5025G is a low-profile high power balanced to unbalanced transformer (Xinger balun) with a power rating of 250 Watts AVG and a peak to average ratio of 12dB in an easy-to-use surface mount package for UHF, VHF and COTS Mil-Aero applications. These compact components are ideal for high volume manufacturing and are more reliable and repeatable than traditional baluns. The component has an unbalanced port impedance of 50Ω and balanced port impedances of 12.5Ω to ground with a 25Ω balance between outputs. Balanced port impedances ease the matching of balanced amplifier's power transistors, which have low impedance levels. The output ports have equal amplitude (-3dB) with 180-degree phase differential. All parts have been subjected to rigorous qualification testing and units are 100% RF tested. The ENIG finished component is a result of in-depth research and development and is available on tape and reel for pick and place high volume manufacturing.

Features:

- 800 – 1215 MHz
- 50 Ohm to 2 x 12.5 Ohm
- UHF, VHF COTS Mil-Aero applications
- Power 250 Watts (AVG)
- Peak to Average Ratio 12dB
- 180° Transformer
- Low Insertion Loss (≤ 0.90 dB)
- Even Order Suppression
- Input to Output DC Isolation
- Surface Mountable
- Production Friendly
- Tape & Reel
- RoHS Compliant
- ENIG finish
- Convenient Package

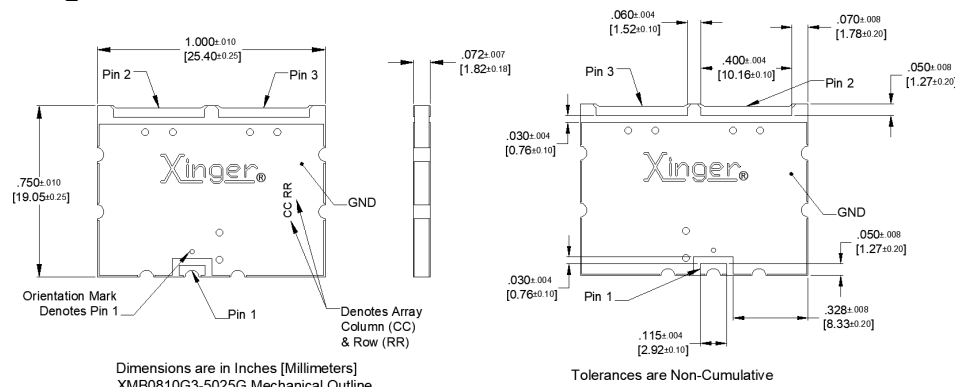
Electrical Specifications*:**

Frequency	Port Impedance*	Return Loss	Insertion Loss	CMRR
MHz	Ohms (Unbalanced: Balanced)	dB min	dB max	dB min
800-1000	50:12.5	15	0.48	25
869-894	50:12.5	15	0.35	25
925-960	50:12.5	15	0.40	25
960-1215	50:12.5	9	0.90	25
Amplitude Balance	Phase Balance	Power	Operating Temp.	
dB max	Degrees	AVG Watts @ 85°C	°C	
0.40	180± 5.0	250	-55 to +150	
0.40	180± 5.0	250	-55 to +150	
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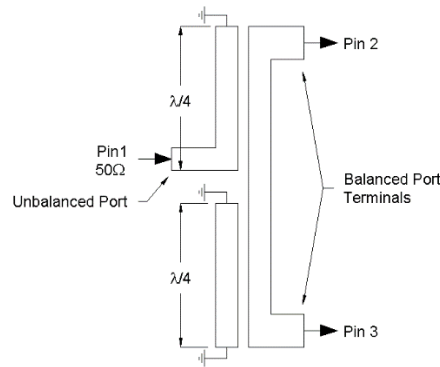
***Specification based on performance of unit properly installed on microstrip printed circuit boards with 50 Ω nominal impedance. Specifications subject to change without notice.

**Insertion Loss excludes reflected power. * 12.5 Ω reference to ground

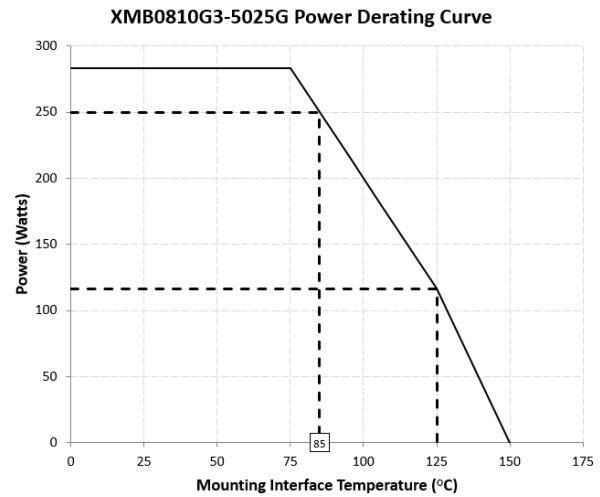
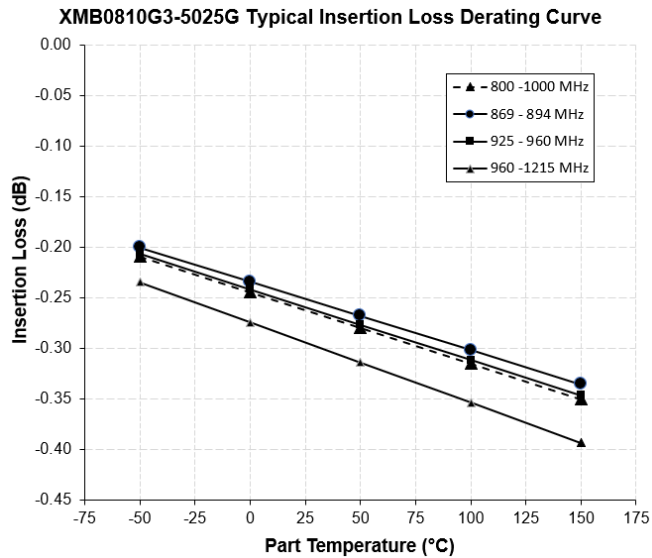
Outline Drawing:



Pin Configuration



Insertion Loss and Power Derating Curves:



Insertion Loss Derating:

The insertion loss, at a given frequency, of the coupler is measured at 25°C and then averaged. The measurements are performed under small signal conditions (i.e. using a Vector Network Analyzer). The process is repeated at -55°C, 85°C and 150°C. A best-fit line for the measured data is computed and then plotted from -55°C to 150°C.

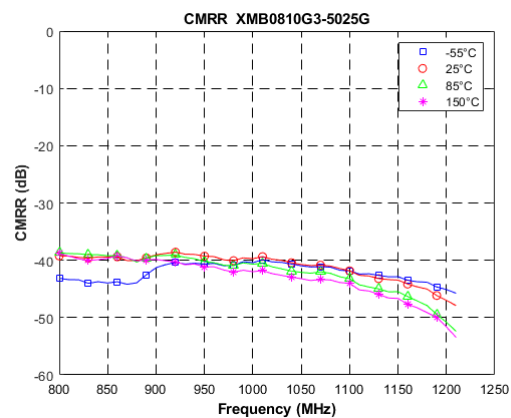
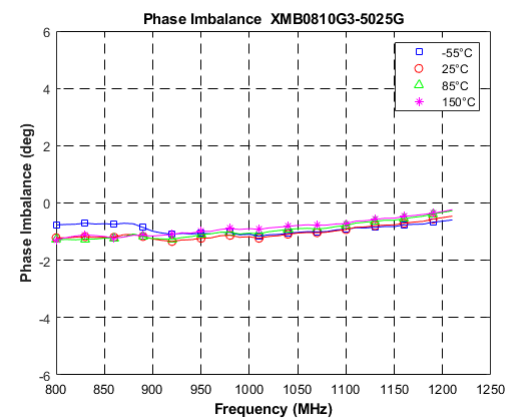
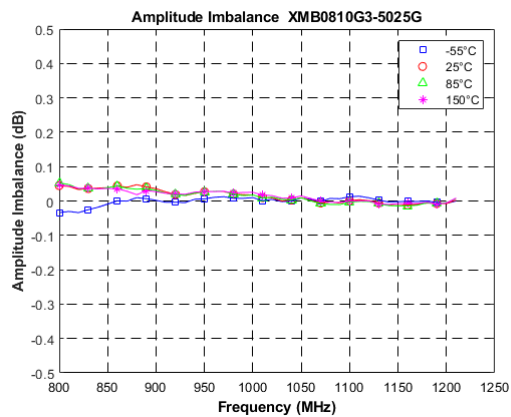
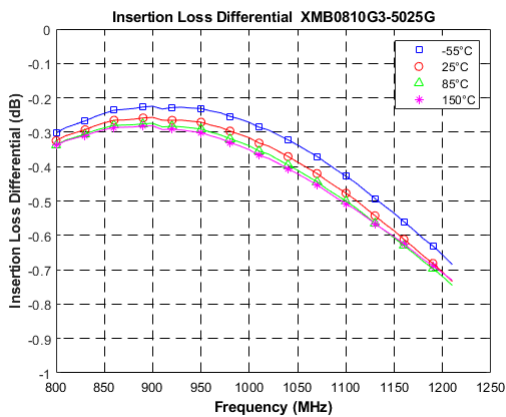
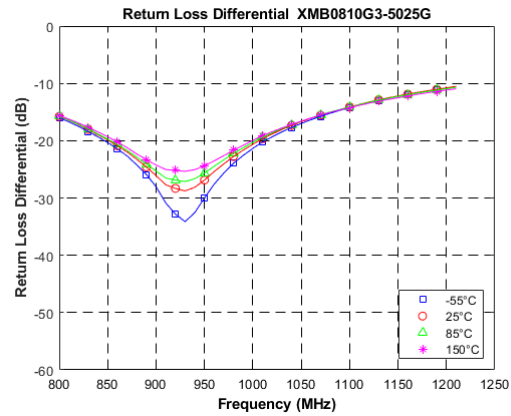
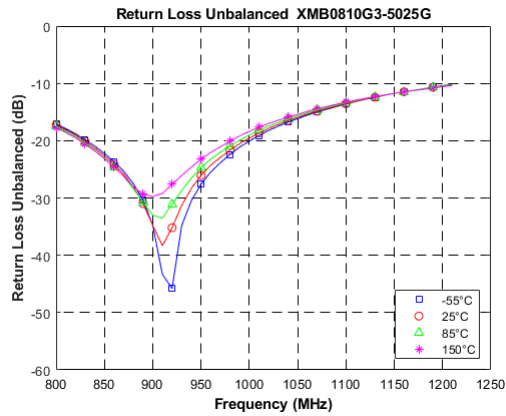
Power Derating:

The power handling and corresponding power derating plots are a function of the thermal resistance, mounting surface temperature (base plate temperature), maximum continuous operating temperature of the coupler, and the thermal insertion loss. The thermal insertion loss is defined in the Power Handling section of the data sheet.

As the mounting interface temperature approaches the maximum continuous operating temperature, the power handling decreases to zero.

If mounting temperature is greater than 85°C, the Xinger coupler will perform reliably as long as the input power is derated to the curve above.

Typical Temperature Performance Plots:

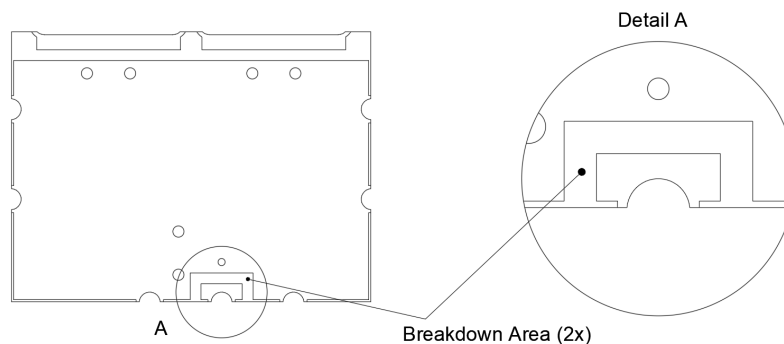


Definition of Measured Specifications:

Parameter	Definition	Mathematical Representation
Return Loss	The impedance match at the single ended port.	$RL = 20\text{Log}_{10}(S_{11})$
Differential Port Return Loss	The impedance match at the differential port.	$RLD = 20\text{Log}_{10} 0.5 * (S_{22} - S_{23} - S_{32} + S_{33}) $
Insertion Loss	Power loss from common mode to differential mode.	$ILD = 20\text{Log}_{10}(0.707 * (S_{21} - S_{31}))$
Phase Imbalance	The difference in phase angle between the two differential ports, offset by 180 deg.	$PB = (\text{Phase}(S_{21}) - \text{Phase}(S_{31}))$
Amplitude Imbalance	The ratio of the power at differential ports.	$AB = 20\text{Log}_{10} \frac{S_{21}}{S_{31}} $
Common Mode Rejection Ratio	The ratio of powers of the differential gain to the common-mode gain.	$CMRR = \pm 20\text{Log}_{10}(S_{21} + S_{31}) / (S_{21} - S_{31})$

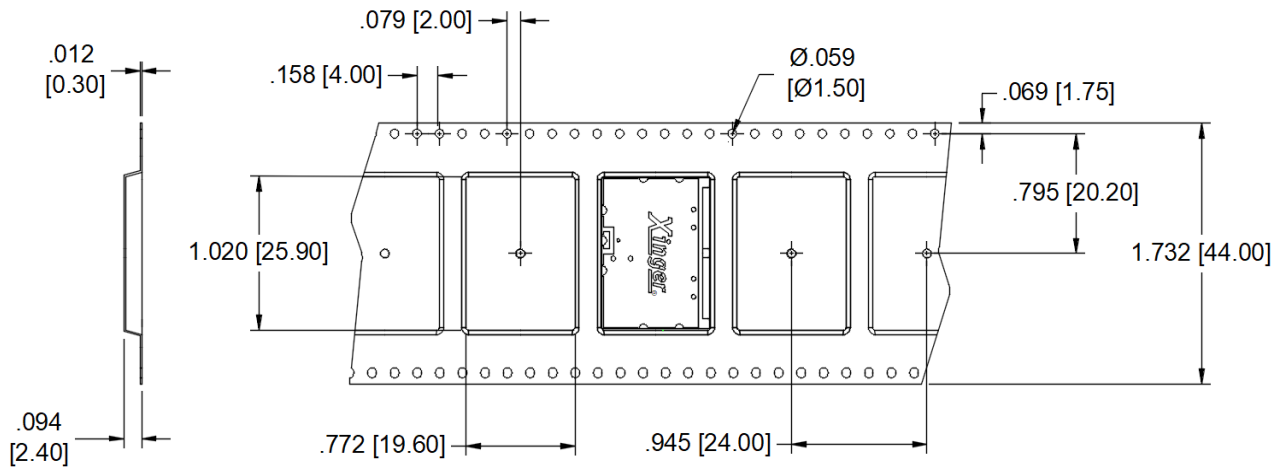
Peak Power Handling:

High-Pot testing of these components during the qualification procedure resulted in a minimum breakdown voltage of 1.5kV (minimum recorded value). This voltage level corresponds to a breakdown resistance capable of handling at least 12dB peak over average power levels, for very short durations. The breakdown location consistently occurred across the pads and the ground pads. The breakdown levels at these points will be affected by any contamination in the gap area around these pads. These areas must be kept clean for optimum performance. It is recommended that the user test for voltage breakdown under the maximum operating conditions and over worst case modulation induced power peaking. This evaluation should also include extreme environmental conditions (such as high humidity).



Packaging and Ordering Information:

Parts are available in reels. Packaging follows EIA 481 for reels. Parts are oriented in tape and reel as shown below. Tape and reel is available in 1000 pcs per reel.



Dimensions are in Inches [Millimeters]

➔ Direction of Part Feed (Unloading)

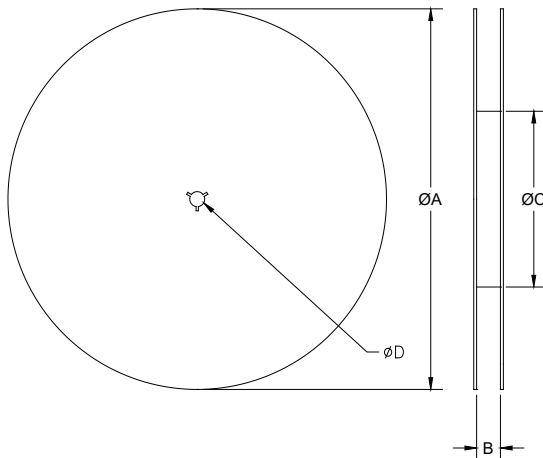


TABLE 1	
REEL DIMENSIONS (inches [mm])	
ØA	13.0 [330.0]
B	1.732 [44.0]
ØC	4.017 [102.03]
ØD	0.512 [13.0]

Contact us:
rf&s_support@ttm.com